

FLEETSMART

Idling Gets You Nowhere

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Energy Efficiency
Fleet Vehicle Initiative
(FleetSmart)

Natural Resources Canada helps commercial and municipal fleets reduce fuel consumption and emissions through improved energy-efficient practices. This contributes to the reduction of greenhouse gases and helps Canada meet the challenges of climate change.



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Idling Gets You Nowhere!

Do you let your truck engine idle for long periods? Idling gets you nowhere and, as you'll see, it can be costly.

Some engine idling is necessary, such as when you stop for a traffic light or when you're caught in a traffic jam. Also, trucks and truck-trailer combinations equipped with power take-offs need to idle to operate refrigeration units, heaters, boom cranes and other truck-mounted equipment.

Unnecessary idling, however, is expensive and generates increased greenhouse gases, which contribute to climate change. In fact, many fleet managers are shocked to discover that some of their vehicles idle up to 65 percent of the time.

Natural Resources Canada's Office of Energy Efficiency plays a leadership role in helping Canadians reduce energy consumption, save millions of dollars in energy costs, address the challenges of climate change and pursue sustainable economic development.



What Happens When You Let an Engine Idle?

Unnecessary engine idling wastes fuel that you've already paid for. It also increases your maintenance costs and reduces the period between engine rebuilds. In addition, idling creates unnecessary exhaust emissions that are released into the atmosphere.

Higher Fuel Costs

Idling gives you zero miles per gallon. Gasoline engines consume between $2\frac{1}{2}$ and four litres of fuel per hour while idling, and diesel engines use from one to four litres per hour, depending on the size of the engine, the idle speed, accessory loads and power take-offs.

Increased Maintenance Expenses

When a gasoline or diesel engine idles for prolonged periods, the engine oil becomes contaminated more quickly than when the vehicle is being driven. Oil contamination is more prevalent in diesel engines because of

the large amount of intake air used in the diesel combustion cycle. When idling at low revolutions per minute (rpm), such as 600 rpm, the excess air in the combustion process cools the cylinder liners, resulting in incomplete combustion and condensation of unburned fuel on the cylinder walls. These deposits are eventually drawn into the engine sump where they contaminate the engine oil and reduce its effectiveness as a lubricant.

Controlled studies demonstrate that prolonged idling typically reduces the operating life of engine oil by 75 percent, from 600 engine-hours to 150 engine-hours.

Compare the convenience of excessive idling against the cost of more frequent oil and filter changes and the amount of time your truck will be out of service while the work is being done.

Shorter Periods Between Engine Rebuilds

Idling produces carbon deposits and unburned fuel residues that will accumulate and damage the engine at several vital points. If you idle your truck excessively, you can expect to pay for more frequent servicing of spark plugs, fuel injectors, valve seats and piston crowns.

If you have the option of setting the idle speed on your diesel engine, keep in mind that idling at low rpm (600 rpm) will reduce cylinder pressures and increase the amount of unburned fuel and carbon deposits, further accelerating the rate of engine wear. Idling at high rpm (1100 rpm) increases cylinder pressure for more complete fuel combustion, but you'll use more fuel due to the higher rpm. Either way, you can't win.

Carefully monitored studies suggest that an engine idling for one hour is equivalent to two hours of driving. Imagine what this will do to your engine-rebuild cycle!

Increased Emissions of Exhaust Pollutants

As your truck engine burns fuel, it generates exhaust emission pollutants that are pumped into the atmosphere. Exhaust emissions are bad for the environment. Pollutants such as carbon dioxide and nitrous oxide are greenhouse gases and must be controlled due to the problem of global climate change. Oxides of nitrogen and emissions from partially burned fuel produce smog when they react with sunlight and ground-level ozone. Smog is a serious public health issue in many cities.

Don't count on public support if you idle your truck unnecessarily. In fact, Canadian cities such as Montréal and Toronto, as well as several U.S. states, have regulations that prohibit most types of non-productive idling.

What Can You Do About It?

An idling engine is, in most cases, money wasted; when truck operators think in terms of life-cycle costs, the waste is evident. Since the costs of engine idling are greater than the benefits, every truck operator needs to reconsider his or her old habits. Everyone wins when the problem is dealt with in earnest: individual truck operators save money and reduce downtime for servicing, and the industry projects a better community image.

Four reasons are most often given to justify deliberate idling for extended periods. Let's examine each one and see how idling can be reduced to save money and cut exhaust emissions.

I. Idling after start-up to warm up the engine and the cab



On a cold morning, every driver wants the cab interior to warm up quickly. Although idling will eventually generate enough heat to warm the cab, it's faster and more efficient to heat the cab by driving the vehicle just after it has been started up.

Temperature tests on engine coolant conducted by the Ontario Ministry of Transportation investigated whether idling was an effective way to warm up engines in cold weather. The tests measured the amount of time needed to raise the coolant temperature from -10°C to its normal operating temperature of 80°C . By driving the vehicle just after start-up (when the oil pressure is up), the coolant temperature rose to 80°C in just 12 minutes. By contrast, it took 30 minutes to raise the coolant temperature to that level while idling the vehicle. Driving away after start-up also gets the drive train working, warms up the differential oil and transmission oil,

and warms up the tires so they can roll well. Idling can't do any of this, no matter how long you wait.

Another way to heat up the cab and engine more quickly is to use a block heater with a timing device that turns on the heater two hours before you plan to depart. The block heater will raise the coolant and oil temperatures enough to thin the oil for better lubrication and reduce start-up strain on the charging system.

Even if you don't have access to electricity to power your block heater, you can still avoid engine idling by installing a cab and/or an engine coolant heater that draws fuel directly from the truck's fuel tank.

These heaters have a proven track record, are readily available and are efficient. They come in a variety of sizes, from 7500 to over 50 000 British thermal units (Btu), and consume less than one litre of fuel per hour. Idling, on the other hand, uses up to four litres of fuel per hour and increases engine maintenance costs significantly due to engine wear. Fuel-fired cab and coolant

heaters cost between \$1,000 and \$3,000 (installed). They are generally fitted in sleeper units for controlled cab heating and in the engine block to heat the coolant for easier cold start-ups.

2. Idling while waiting to load or unload



Waiting at a loading dock for customs clearance or waiting at railway and ferry crossings can be the most frustrating part of a trucker's job. Don't let your engine idle unnecessarily while your truck is standing. The coolant will stay warm for some time after shutdown. Shut off your engine and save the cost of idling.

3. Idling to keep the cab warm or cool while stopping to eat



If you're just stopping for a meal, how much will the interior temperature of the cab drop or increase while you're away from your rig? We already know that the engine coolant will remain quite warm for the

hour or so you're likely to be out of the cab to eat. In fact, studies show that it takes between 12 and 14 hours for a hot engine to cool down to the outside air temperature.

After a meal break, the still-warm engine will start easily, and you'll be able to draw instant heat from the truck's heater or turn on the air conditioner, if needed. You'll also get more heat or air conditioning more quickly if you drive off right away.

4. Idling overnight or while the driver sleeps, to maintain climate control and to ensure morning start-up



In extremely low temperatures (below -30°C), gasoline engines are difficult to start and diesel ones are next to impossible. What if you have to sleep in your unit as well? In the past, without a heated garage or an electrical connection for your block heater, you would normally have had no option other than to idle all night to guarantee

morning start-up. New electronic engines are now available that make all-night idling unnecessary.

An important development made possible by the electronic engine is the automatic stop-start engine feature, or optimized idle control. This feature monitors the engine automatically and starts and stops the engine whenever necessary to maintain coolant temperature, battery voltage and cab temperature. You can use an automatic stop-start engine feature for true set-it-and-forget-it convenience; it will always keep your coolant warm, your batteries charged and the temperature of your cab comfortable. The engine still idles when it cycles on, but the system optimizes idling by automatically controlling the idle speed to keep the coolant within a narrow temperature range. No longer will your truck have to idle for hours at a time. Stop-start idle control makes good use of the electronic capabilities of your engine.



You can also install a heater in your diesel fuel tank to prevent any water in the tank or fuel-supply lines from freezing, to prevent the fuel from waxing at low temperatures and to ensure the fuel atomizes properly when injected into the engine. Also available are generators that draw fuel directly from the truck's fuel tank to produce electricity for heat, air conditioning and appliances.

Don't cut the life of your expensive 11-litre engine to supply a little heat or electricity; a small ancillary generating unit will cost you less in the long run.

Vehicle operators and fleet owners should do everything they can to reduce unnecessary idling to cut operating and maintenance costs, boost productivity and help the environment.



Notes



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*Leading Canadians to Energy Efficiency at Home,
at Work and on the Road*

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